SHAUGHNESSEY NO.

8
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 4/14/81 OUT 6/3/81

FILE OR REG. NO.

PETITION OR EXP. PERMIT NO. 10182 - EUP - EU

DATE OF SUBMISSION 4/1/81

DATE RECEIVED BY HED 4/14/81

RD REQUESTED COMPLETION DATE 7/14/81

EEB ESTIMATED COMPLETION DATE

RD ACTION CODE/TYPE OF REVIEW 720/EUP - Nonfood Use

TYPE PRODUCT(S): I, D, H, F, N, R, S Rodenticide

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. W. Miller (16)

PRODUCT NAME(S) Brodifacoum Oat Groats

COMPANY NAME ICI Americas, Inc.

SUBMISSION PURPOSE EUP for testing Brodifacoum Oat Groats against Columbian Ground Squirrel

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.

Fish and Wildlife Environmental Safety Review

100.0 Submission Purpose - Experimental Use Permit

100.4 Proposed EUP Program

100.4.1 Objective

The U.S. Fish and Wildlife Service under contract with ICI Americas Inc. is requesting an EUP to evaluate the efficacy of Brodifacoum treated grain bait to control the Columbian ground squirrel (Spermophilus columbianus) in Montana.

100.4.2 Duration/Date/Amount Shipped

The proposal indicates that approximately 300 acres will be hand baited with a total of 600 lbs of product representing 0.03 to 0.06 pounds of active ingredient depending on whether 50 or 100 ppm baits are utilized. Concentration on bait and amount used per burrow to be used in tests are indicated to be dependent inpart on the LD50 of brodifacoum to the Columbian ground squirrel. Tests to determine this were indicated to be underway at time of submission.

The Permit is requested for a one year period, from date of issuance.

100.4.3 Application Procedures

The proposal calls for either 50 or 100 ppm brodifacoum out groats to be applied by hand baiting at a rate of 5-20 grams per burrow depending on results of toxicity tests.

100.4.4 Target Pest

Columbian ground squirrel (Spermophilus columbianus)

100.4.5 Geographical Site Features

The Study is proposed to be conducted in Montana west of the continental divide probably in one of the following counties: Missoula, Powell, or Lewis and Clark. Also the counties of Jefferson, Madison, Beaverhead, Silverbow, Deer Lodge, Ravalli, Granite, and Mineral are mentioned as possible areas where tests could be conducted. Test sites are indicated to be privately owned rangeland (improved or unimproved pastures).

100.4.6 Test Program Description/Features

The study proposal calls for six test plots (3 treated - 3 controls) approximately 82 acres each, on either improved or unimproved pastures. ~~pastures.~~ In the center of each area a 2.47 acre trapping grid (10 X 10 M) is to be established.

Population changes of ground squirrels is to be measured by mark-recapture and radio telemetry following the application of brodifacoum grain bait.

Pretreatment trapping is scheduled for early June for six days. Each trapped squirrel will be sexed and a numbered ear tag placed in each ear. For three days following the pretreatment trapping period one treated and one control plot will be baited each day. Amount of bait applied per plot will depend on burrow density.

Following baiting for 14 days the study areas will be systematically search. On days 1-3 post-treatment treated study plots will be searched after squirrel activity stops in the evenings. On days 4 through 14 each plot and adjacent areas are to be systematically searched. All dead animals found will be collected and those not saved for residue analysis will be buried.

101.0 Chemical and Physical Properties

See previous reviews

102.0 Behavior in the Environment

See previous reviews

103.0 Toxicological Properties

Species	Toxicity
Male rat	LD50 - 0.27 mg/kg
Female rat	LD50 - 0.50 mg/kg
Rabbit	LD50 - 0.29 mg/kg
Cat	LD50 - 25.0 mg/kg
Dog	LD50 0.25 - mg/kg
Sheep	LD50 - 25.0 mg/kg
Mallard	LD50 - 2.0 mg/kg
*Bobwhite quail	LC50 - 0.8 ppm
*Mallard	LC50 - 2.7 ppm

*40 day LC50 - 5 days of treated diet and 35 days observation

104.0 Hazard Assessment

Laboratory toxicity studies have shown that brodifacoum is extremely toxic to most species tested, with LD50's ranging from 0.27 mg/kg for rats to 25 mg/kg for cats and sheep with most acute toxicity figures less than 2.0 mg/kg (See Sec. 103 above). Dietary toxicity figures range from 0.8 ppm for the bobwhite quail to 2.7 ppm for the Mallard duck.

For these trials proposed concentrations on bait are 50 or 100 ppm brodifacoum, several times the medium lethal dose for most indicator species. This coupled with the high propability that many of the non-target wildlife species in the area of treatment would readily accept the bait, oat groats, indicates a high risk to seed eating avian and mammalian species.

In addition to risk to primary consumers, there appears to be also the potential of secondary poisoning to non-targets which prey or scavenge on poisoned species. Although available data are scant, studies cited in previous reviews indicate this possibility. Turner (4/26/79) gave the following summaries of four studies in a review of an EUP for brodifacoum for commensal rodent control:

1. One of six beagle dogs fed rats killed with high intubated doses of brodifacoum died; three others had slight to moderate hemorrhaging detected in autopsy. Study was considered invalid because of a major discrepancy between text and tables.

2. Two of five foxes (4 red, 1 gray) died after being fed rats killed with large intubated doses of brodifacoum. The three survivors exhibited slight to moderate hemorrhage as detected during autopsy. The study was classified supplemental because it was felt it indicated a secondary hazard, but was deficient because the amount of brodifacoum ingested by the foxes was unknown.

3. In a study conducted by Putuxent Wildlife Research Center 5 of 6 barn owls fed brodifacoum killed rats for 1-10 days died. The survivor ingested 67g of rat in one day. The Barn owls that died had been fed 154, 299, 370, 492 and 368g of poisoned rat for 3, 3, 6, 10, and 10 days, respectively. Rats had died after free choice feeding on 0.002% brodifacoum bait and untreated lab chow. Owls died 8-11 days after dosing.

4. Turner also mentioned results of a study which was submitted informally by the registrant. Four of 4 red tailed hawks and 1 or 2 rough-legged hawks died after being fed one poisoned rat each day for four days.

Although several questions about some of these studies need clarification, together they strongly suggest a potential of secondary hazard from the use of brodifacoum to non-target wildlife.

In summary, the proposed use appears to present a high risk to most avian and mammalian species in the area of use, either primarily to species which would readily accept the bait or secondarily to species which prey or scavenge on poisoned species.

However, for the proposed test the significance of these hazards is mitigated due to the small acreage involved, a maximum of 300 treated acres. Therefore, it is felt that no significant impact to non-target non-endangered wildlife population is posed from the proposed test.

104.7 Endangered Species Consideration

The only potential significant impact posed by the proposed test could be to endangered species. Within the area indicated in the submission as potential test sites, four endangered species occur, grizzly bear, gray wolf, bald eagle, and peregrine falcon. Each a predator and with the potential of secondary poisoning from brodifacoum suggests potential problems if these species frequent test sites.

Due to these concerns, Denver Wildlife Research Center Personnel initiated Section 7 consultation with the Office of Endangered Species (OES). OES concluded that, provided certain precautions were followed, the proposed trials should not have a detrimental impact on the above listed species. The major precaution OES suggested was site selection be coordinated closely with the endangered species experts in Montana to avoid areas with/in the range of these endangered species.

In conversations with Denver research personnel and individuals knowledgeable on endangered species in Montana (including, Dale Harms, Endangered Species staff FWS Region 6; Wayne Brewster, Endangered Species Staff FWS, Region 6; Barry Mulder, Endangered Species staff FWS, Washington D.C.; and Dennis Flath, Montana Department of Fish, Game and Parks) it appears that if trials are conducted south of Helmville in Powell County, Montana, the chance of exposing any endangered species is extremely remote. Therefore, if the tests are conducted in this area risk to endangered species should be minimal.

107.0 Conclusion

EEB has reviewed the proposed EUP application for efficacy tests on brodifacoum for the Columbian Ground Squirrel. Provided the following restrictions are imposed, impacts to non-target wildlife populations should be minimal:

1. Test sites are located south of Helmville, Montana in Powell County.

2. If during the pretreatment period a sighting of an endangered species is made in the vicinity of the study area(s), the application be delayed until the chance of exposure has passed.

3. If after treatment an endangered species is sighted, measures ~~with~~ be initiated to scare off the individual(s). For example, Acetylene exploders, continuous monitoring of study plots, etc.

4. To lower potential hazards to all non-targets which might scavenge on poisoned animals, plots are searched daily after treatment and all carcasses found are removed.

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